

A Rare Presentation of the Extra Renal Pelvis Containing Multiple Calculi

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Abstract

Renal calculi in the intrarenal pelvis are common in urological clinic but multiple stones in the extrarenal pelvis are a rare occurrence because of early diagnosis and treatment of most such cases. A very unusual presentation of renal calculi was observed in the left kidney during routine undergraduate dissection in anatomy department. We found four large, pyramidal, smooth surfaced calculi in the extrarenal part of renal pelvis in a cadaver of 65 year old female. The pelvis, occupied with stones was seen to be displaced anteriorly from its usual posterior location at the renal hilum. The left ureter commenced from the inferior aspect of this anteriorly placed renal pelvis near the inferior pole of the kidney. Knowledge of such rare anatomical variation is essential for urologists, nephrologists, uro-radiologists during various open and endoscopic surgical procedures and radiodiagnosis.

Key words: *multiple calculi, extrarenal pelvis, calculi, ureter, anatomical variation*

Introduction

Stone in kidney is a common presentation in everyday urological practice affecting 1 in 1000 person annually in western countries and the incidence is showing an increasing trend in developing countries too. The prevalence of calculi ranges from 4-20% in different geographical distribution. India has been reported to be a part of Afro-Asian stone forming belt. High incidence of kidney stones in this belt is due to high temperature, which increases perspiration resulting in concentrated urine which promotes crystallization of urine.[1]

Extrarenal calculi are a rare presentation of stones in the renal calyx and pelvis which is located outside the renal parenchyma. Normally, the pelvis of kidney lies posterior to renal vein and artery at the renal hilum and is located within the parenchyma of kidney.[2] The anatomical variations in the upper portion of collecting system of kidney like extrarenal calyces and pelvis documented least in literature.[3] These affects the mode of surgery as the

main factors that influence the decision of selecting the appropriate procedure for a particular patient are size, number and location of the calculi. The choice of treatment for removal of renal pelvic stones larger than 2 cm is percutaneous nephrolithotomy (PCNL) with the success rate upto 98%. However, PCNL is not without complications and is more risky in patients with Guy's Stone score (GSS) III. GSS III comprises of the category of multiple stones in a patient with abnormal anatomy.[4]

The aim of reporting this unique anatomical variant is to alert the nephrologists with this kind of anatomical and pathological presentation, thereby increasing safety during surgical intervention around this region.

Case report

We found multiple renal calculi in a 65 year old female cadaver, during the routine undergraduate dissection in our department. Four large, greyish in colour, pyramidal, smooth surfaced calculi were observed in the extrarenal pelvis of left kidney (Figure 1-a, b, c, d). The dimensions of the calculi were (a=3.4x 2.9 cm, b=3.7x2.9cm, c=3.7x 2.8cm, d=4.0 x 3.1cm). The left renal pelvis was situated along the anterior aspect of kidney and the ureter commenced from the inferior portion of this anteriorly displaced renal pelvis. The structures observed at the renal hilum were pelvis of kidney, renal vein and renal

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Figure 1: Renal calculi in situ in an extra renal pelvis.

artery. The pelvis was thin walled and enormously dilated with the stones and was connected to the renal parenchyma by loose areolar tissue. It was easily separable from renal tissue (figure 2). There were opening of four major calyces within the pelvis (figure 3).



Figure 2: Dilated renal pelvis easily separated from normal renal tissue.



Figure 3: Opening of four major renal calyces indicated by arrow

The posterior surface and superior and inferior poles of the kidney were normal. Segmental branch of left renal artery was traversing anterior to the pelvis to supply the upper pole of kidney. The dimensions of kidney were length=11.3cm; breadth=6.8cm; and thickness=5.1cm and was in its normal anatomical position. Remaining abdominal and pelvic part of left ureter was in its normal course and relation. The right kidney and the structures at its hilum were noted to be normal.

Discussion

In spite of vast clinical advances, urinary stones remain a major medical problem all over the world.[5] Abnormal development of urinary tract as one of reason for occurrence of urinary stones is not substantiated. Pereira-Correia et al found only one case in 113 cadavers, in which the pelvis was located anterior to the renal vessels in their study on extra parenchymal structures at the renal hilum. They did not observe any case where the ureter was starting from inferior portion of the pelvis.[6] The complication rate rises up to 41.7% during PCNL in patients having GSS score III which involves the patients having multiple calculi with abnormal anatomy; the reported rare case comes under this category.[4] Sanudo et al also emphasized that about 10% of clinical malpractice is due to the ignorance of anatomical variations.[7]

Very large size stones, as reported in this case can be removed successfully by PCNL with a success rate of 98%. The procedure involves insertion of a needle through the skin directly into the renal collecting system and then dilating the tract approximately 1 cm. Instruments are then passed through this tract to breakup and remove stones. The posterior approach is preferred by most of the surgeons.[8] In the present case, stones were observed in anteriorly placed renal pelvis and the interesting feature about the case is that normal healthy renal parenchyma was in close posterior relation of this pelvis. Therefore, in an attempt to remove these renal calculi from the posterior approach during PCNL, there is a possibility of damaging normal renal tissue and vasculature leading to devastating complications like injury to segmental renal vessels that may lead to a threatening haemorrhage. During the process of development, changes regarding size, shape, external features, location and position of the kidney happen concomitantly. To begin with the kidneys are located in the pelvis and the hilum directed anteriorly; later both kidneys ascend to their lumbar location and rotate so that the hilum is directed

medially. In this case we observed an anteriorly displaced renal pelvis within a hilum that faced anteriorly. The above presentation might be a consequence of nonrotation of hilum of kidney during intrauterine life, or might be secondary to the weight exerted by the large renal calculi. Acceptance of variable development as a norm and consequences thereof should be kept in mind by surgeon during nephrolithotomy and renal transplantation and by radiologists during their routine diagnostic procedures.

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